ECOSYSTEM STATUS INDICATORS
Physical Environment

EASTERN BERING SEA
Variations in water mass properties during fall 2000-2004 in the eastern Bering Sea-BASIS

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Last updated: September 2005

Oceanographic and fisheries data have been collected in the Eastern Bering Sea (EBS) during fall 2000-2004 for the U.S. component of a multiyear international research program, Bering-Aleutian Salmon International Survey (BASIS). Stations were located between 54°N and 68°N, at 15-30 km resolution, although spatial coverage varied by region and by year. Bristol Bay stations were sampled from mid August to early September during all five years. While, stations in the central and northern Eastern Bering Sea were generally sampled from mid September to mid October. Oceanographic data were obtained from vertical conductivity-temperature-depth (CTD) profiles and laboratory analyses of discrete water samples at select depths (2003 and 2004 only). Oceanographic variables include temperature, salinity, nutrients, chlorophyll a, and phytoplankton taxonomic characteristics (based on phytoplankton species identification and chlorophyll a size fractionation). A long-term goal of this research is to characterize interannual variations in the abundance and distribution of lower and higher trophic level organisms in relation to oceanographic features in the EBS (see *Nutrients and Productivity* and *Forage Fish* sections of this report).

The surface temperature, salinity and density (sigma-t) for 2000-2004 in the Eastern Bering Sea are shown in Figure 31. Bristol Bay surface temperatures were warmer in 2002, 2003 and 2004 than in 2000 and 2001. The lower surface salinities near the coast indicate major input from the Yukon and Kuskoquim rivers and can be used to estimate the Inner Front location. Surface density variations were largely driven by salinity. Surface salinities in the Middle Domain of Bristol Bay were lower in 2003 and 2004 than in earlier years. Analyses of vertical sections in Bristol Bay (data not shown) indicate that the pycnocline depths were shallower in 2002 and 2004 than in 2000 and 2001. The location of the cold pool, deep cold water formed during ice melt, can have a large impact on fisheries distributions. The cold pool was observed south of St. Lawrence I. (between 168 and 174°W and 60 to 63°N) in 2002 and 2004 during early October and mid September, respectively (see Figure 39 in the *Nutrients and Productivity* section of this report).

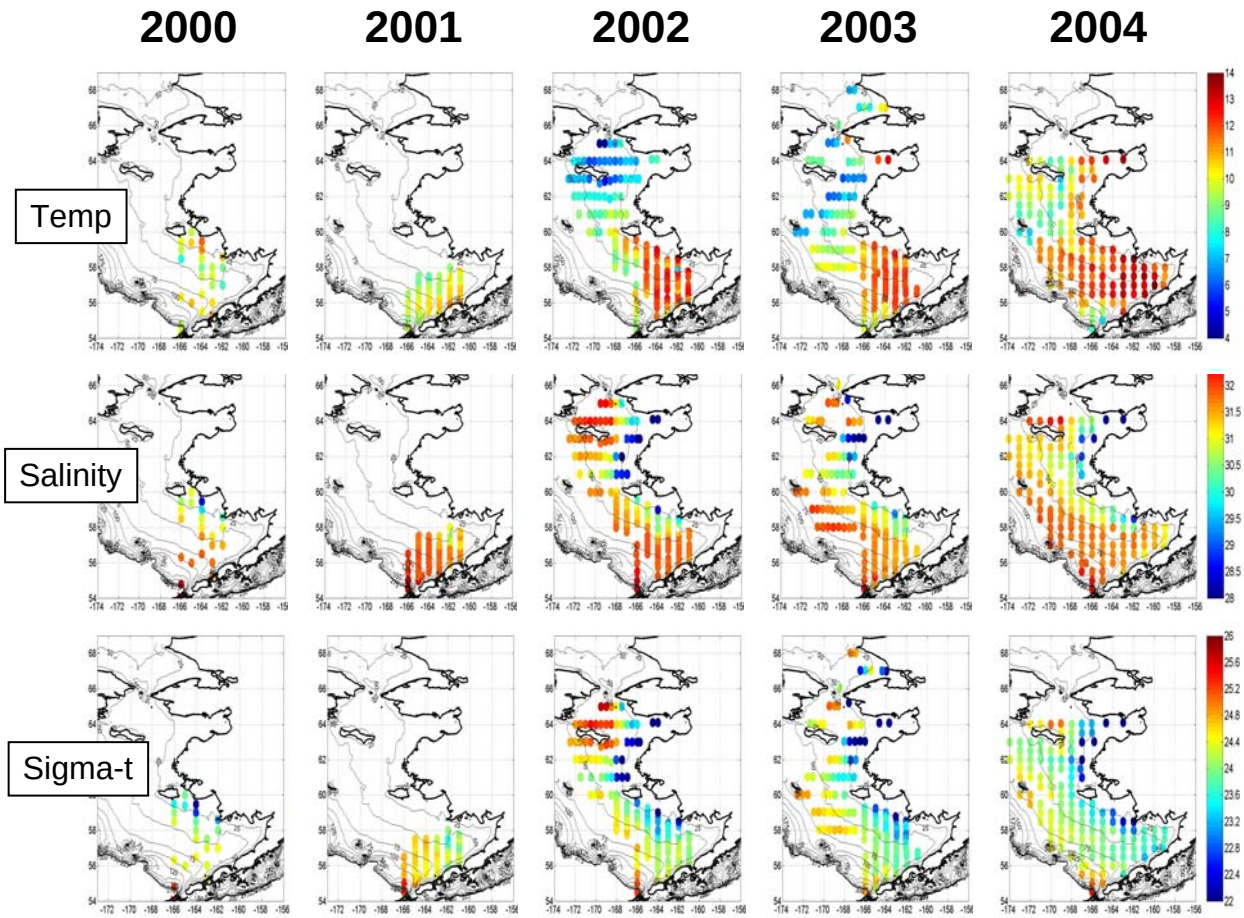

Figure 31. Surface (5 m) temperature (°C), salinity and density (sigma-t, kg m^{-3}) from CTD casts collected mid-August to mid-October, 2000-2004. Bristol Bay stations were sampled from late August to early September for all years.